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(54) **SEAT FRAME**

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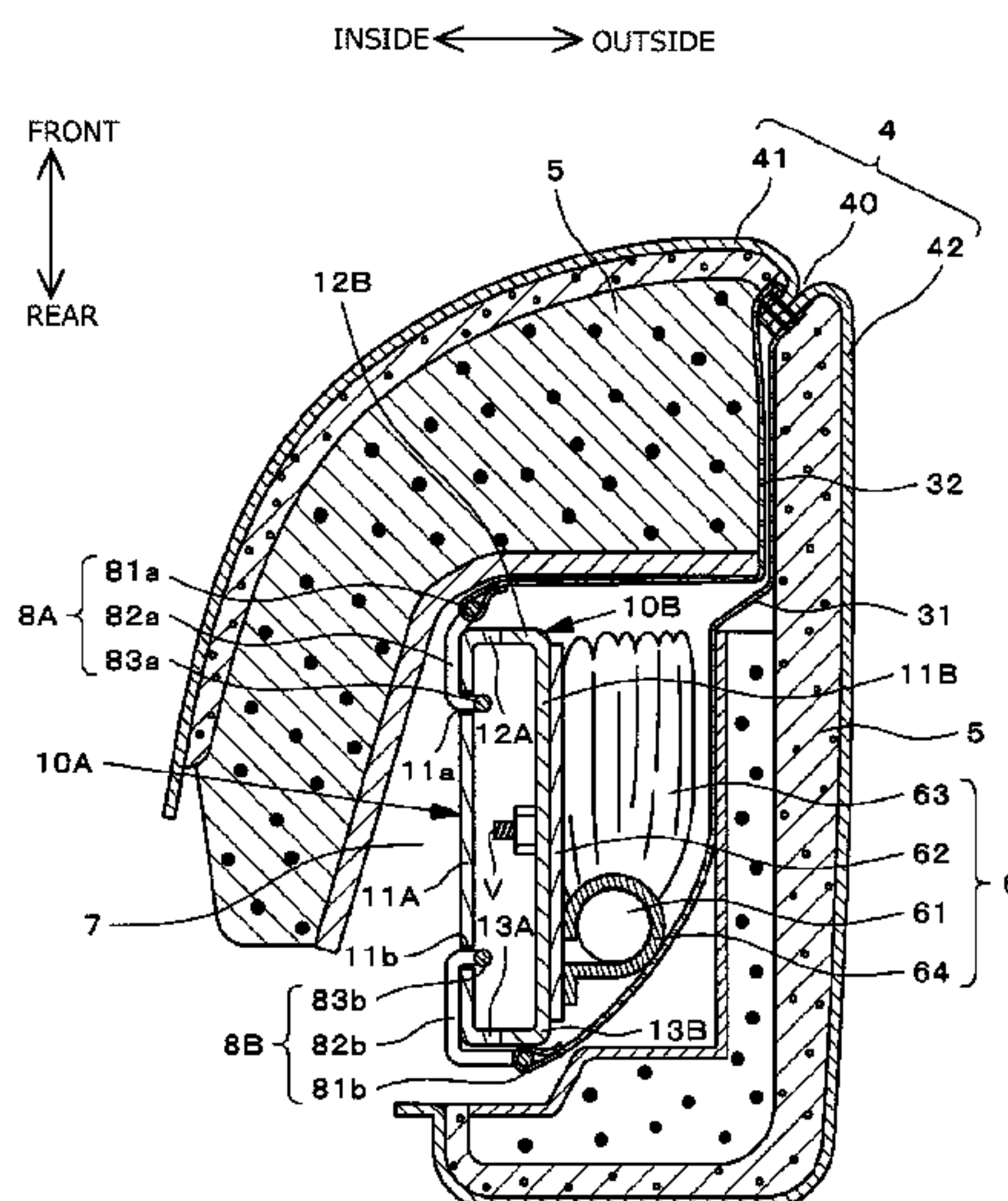
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(57) **ABSTRACT**

Provided is a readily-attached seat frame that has a compact periphery of a stay cloth attachment portion while maintaining a high deployment performance of an airbag. A seat frame is provided in which an airbag module is disposed in a seat back frame. The seat back frame is provided with a guide member end attachment member that locks ends of guide members for facilitating the deployment of an airbag provided in the airbag module, and the attachment positions of the guide members in the guide member end attachment member are disposed at the inside of the seat back frame in relation to the attachment position of the airbag module 6.

**17 Claims, 11 Drawing Sheets**



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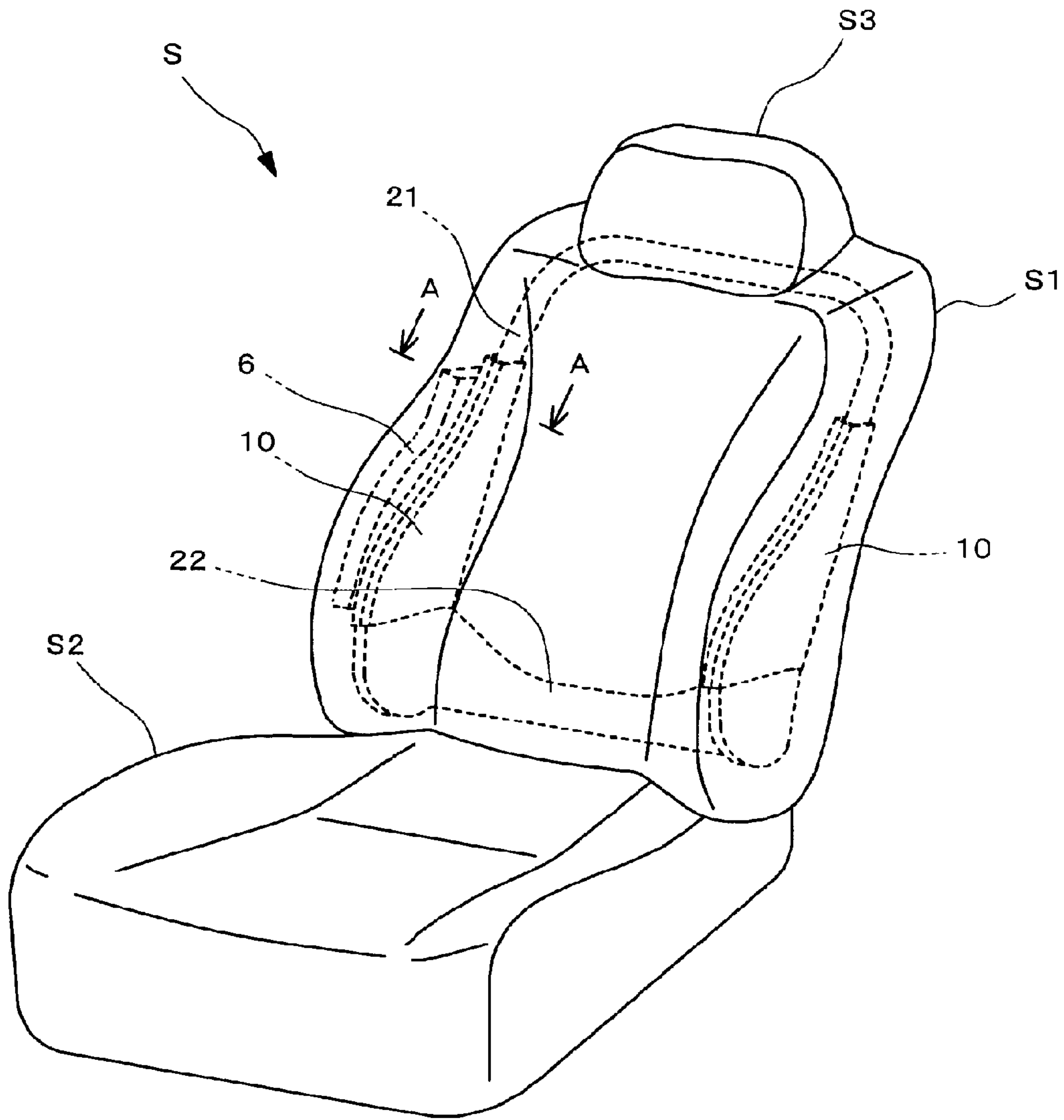


FIG. 1

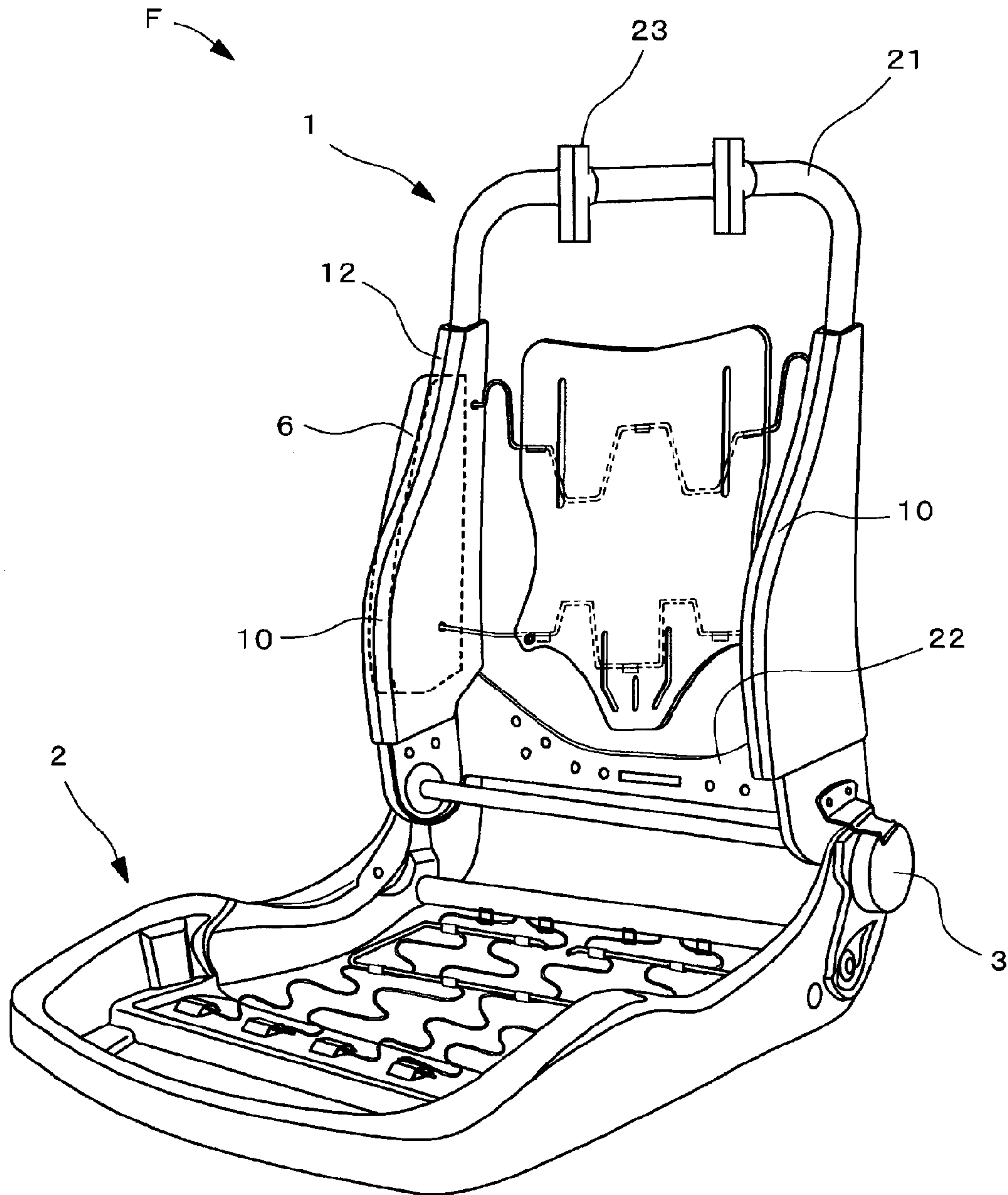


FIG. 2

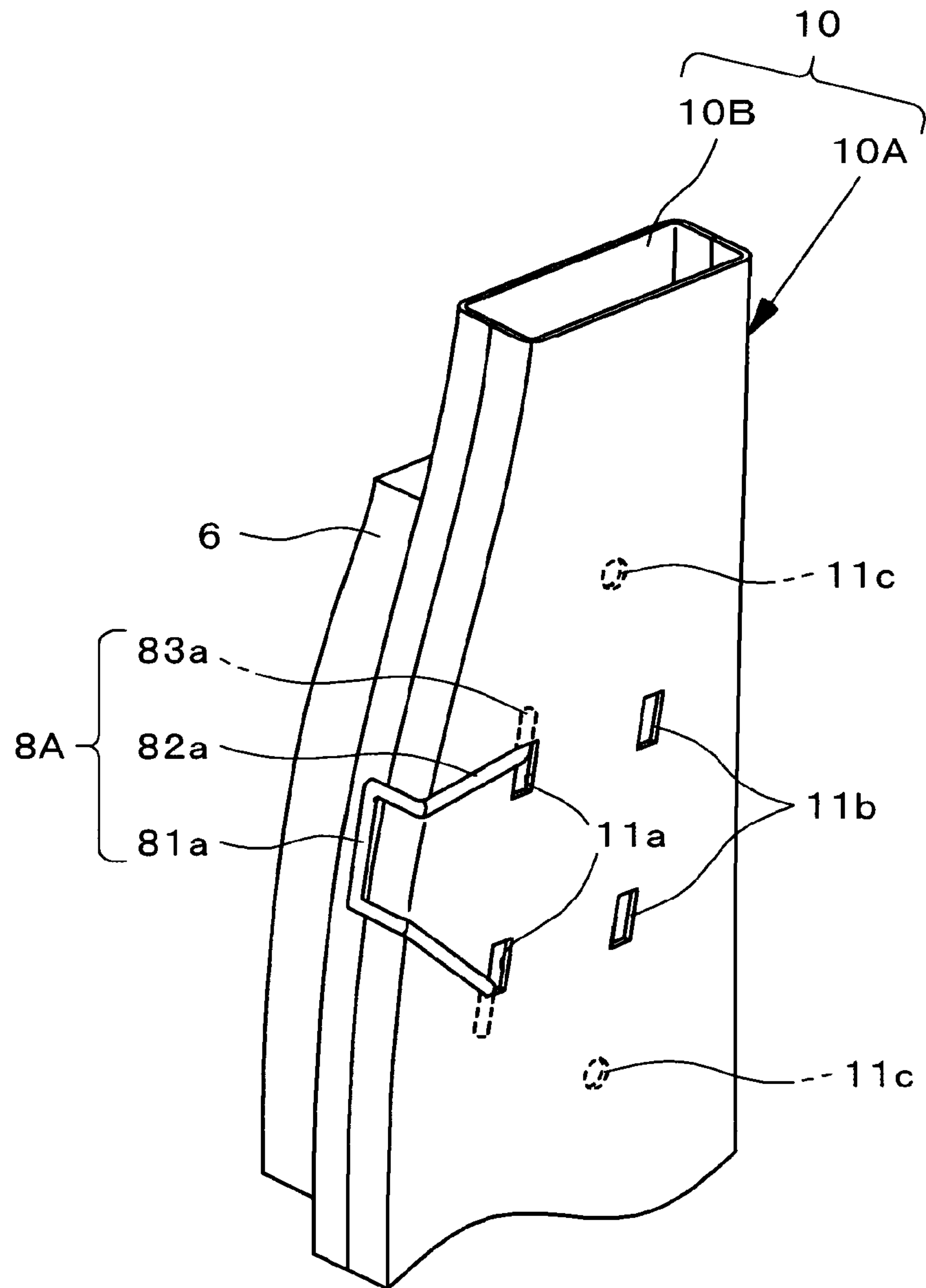


FIG. 3



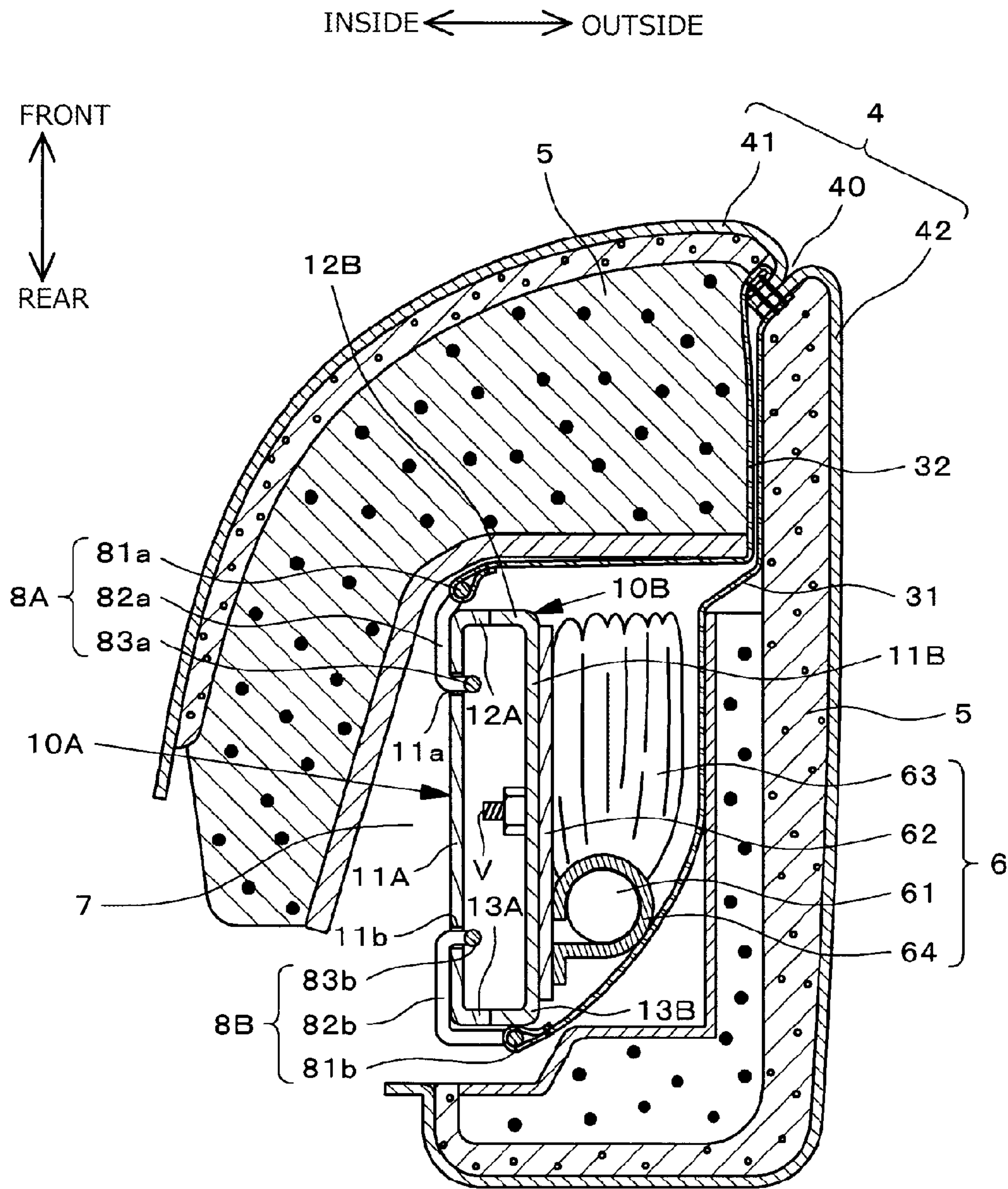


FIG. 4

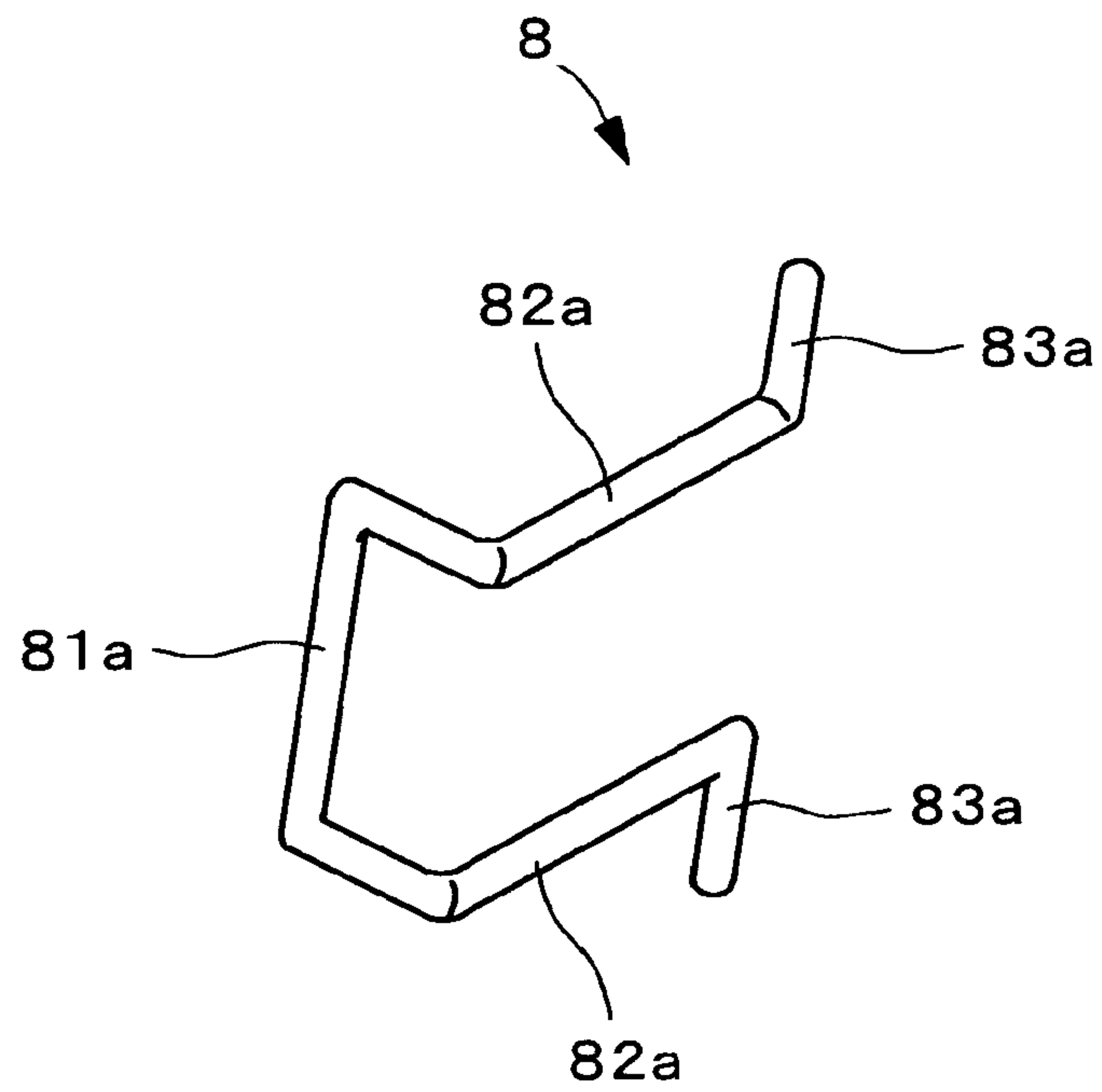


FIG. 5

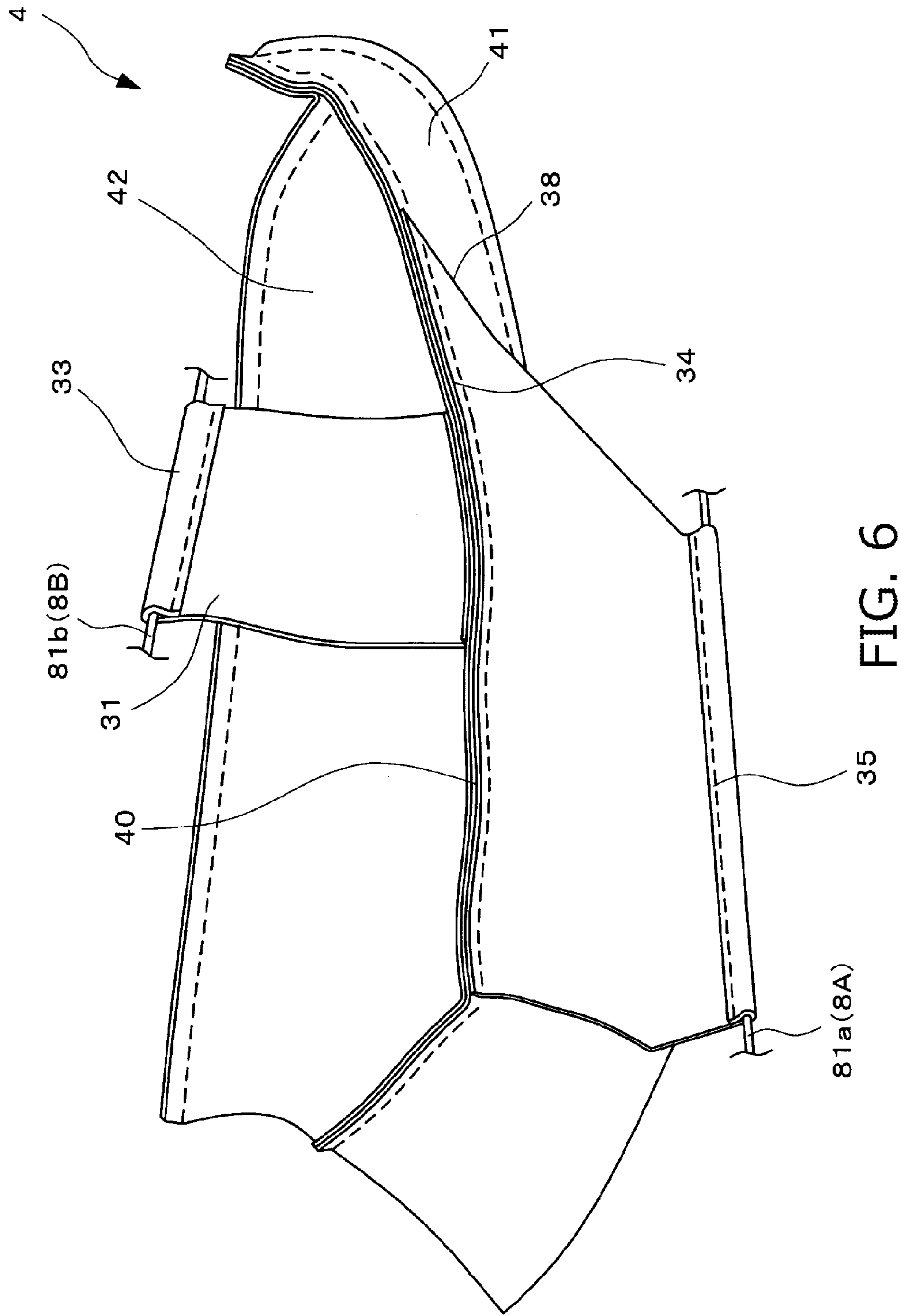


FIG. 6



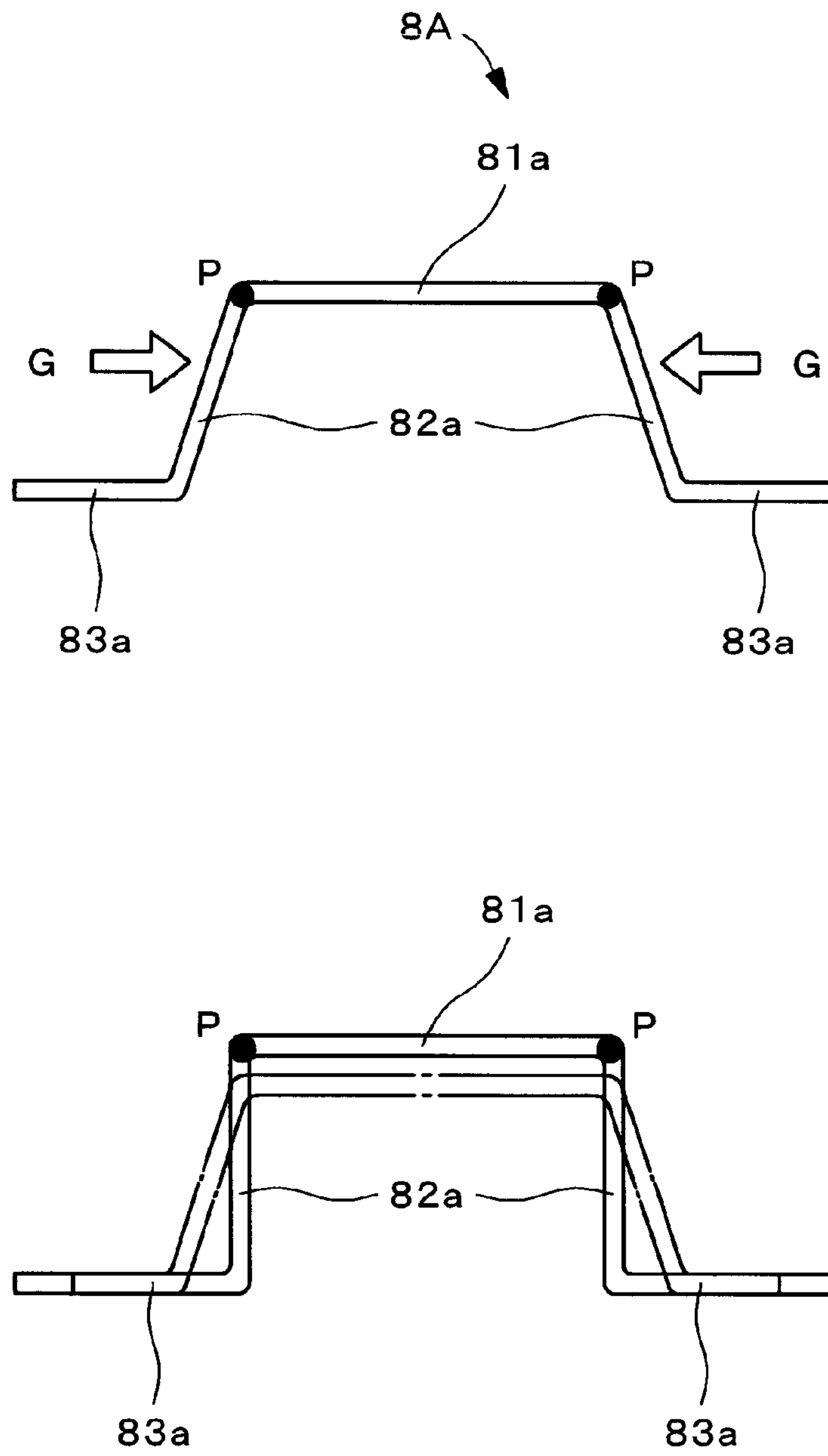


FIG. 7

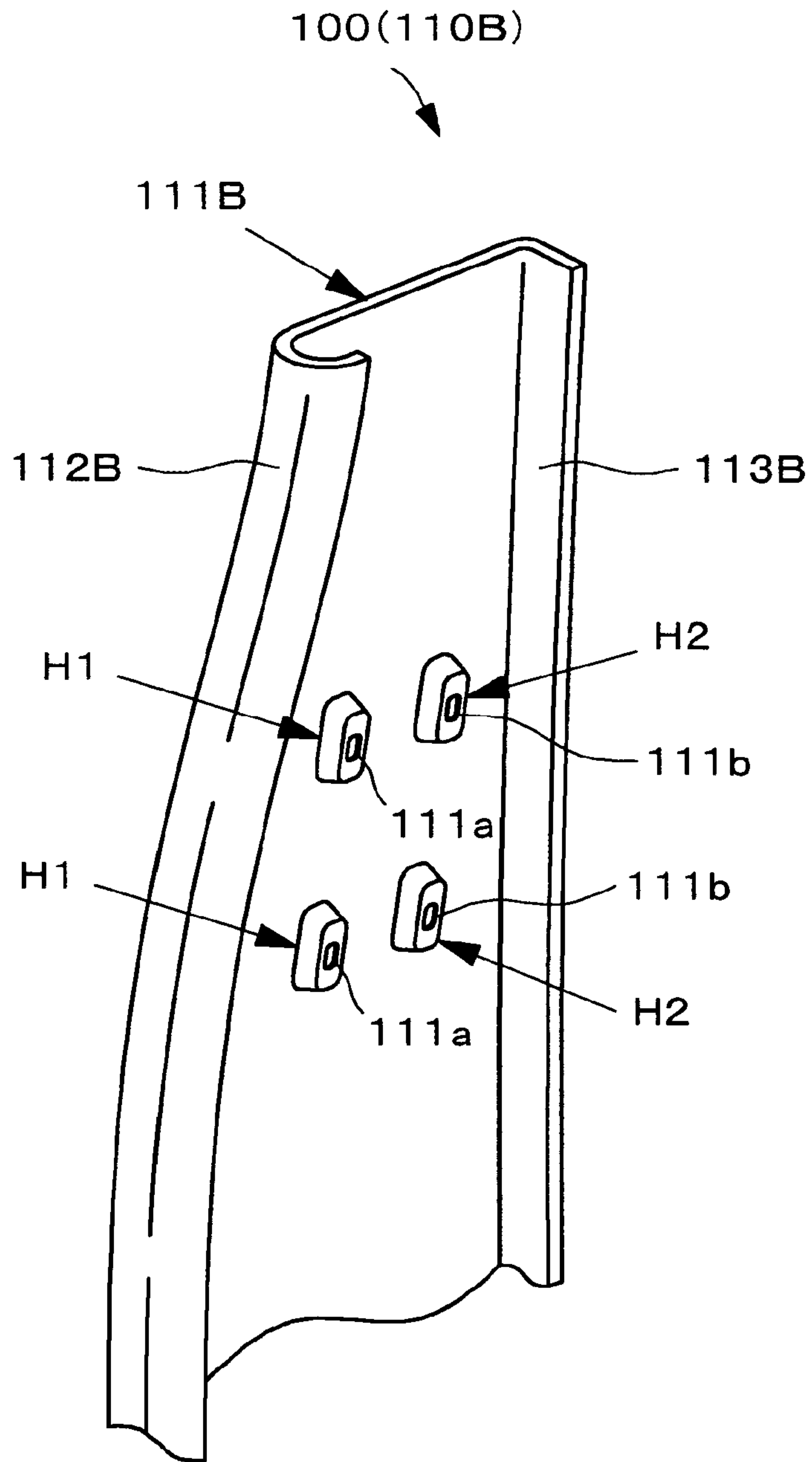


FIG. 8

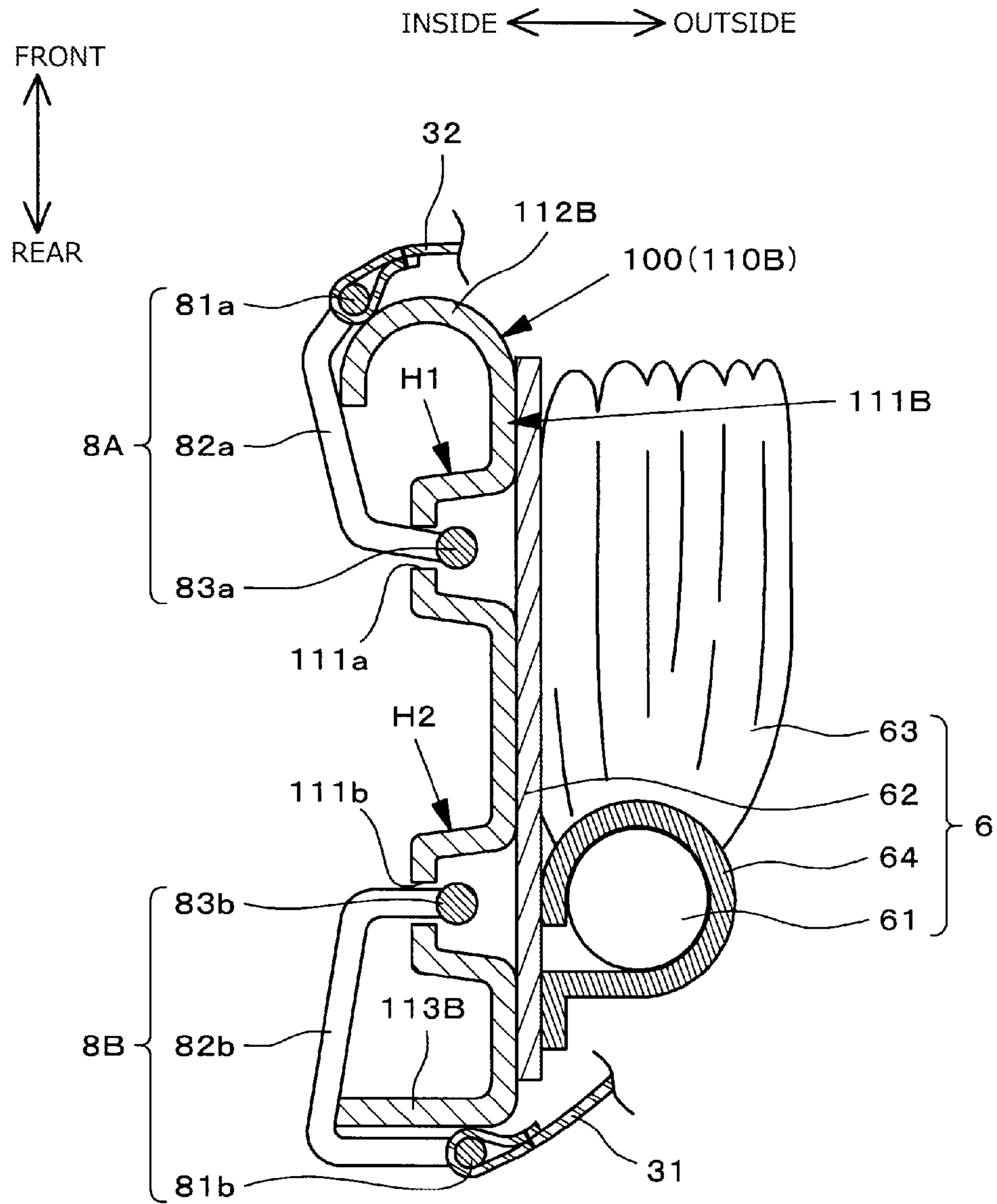


FIG. 9

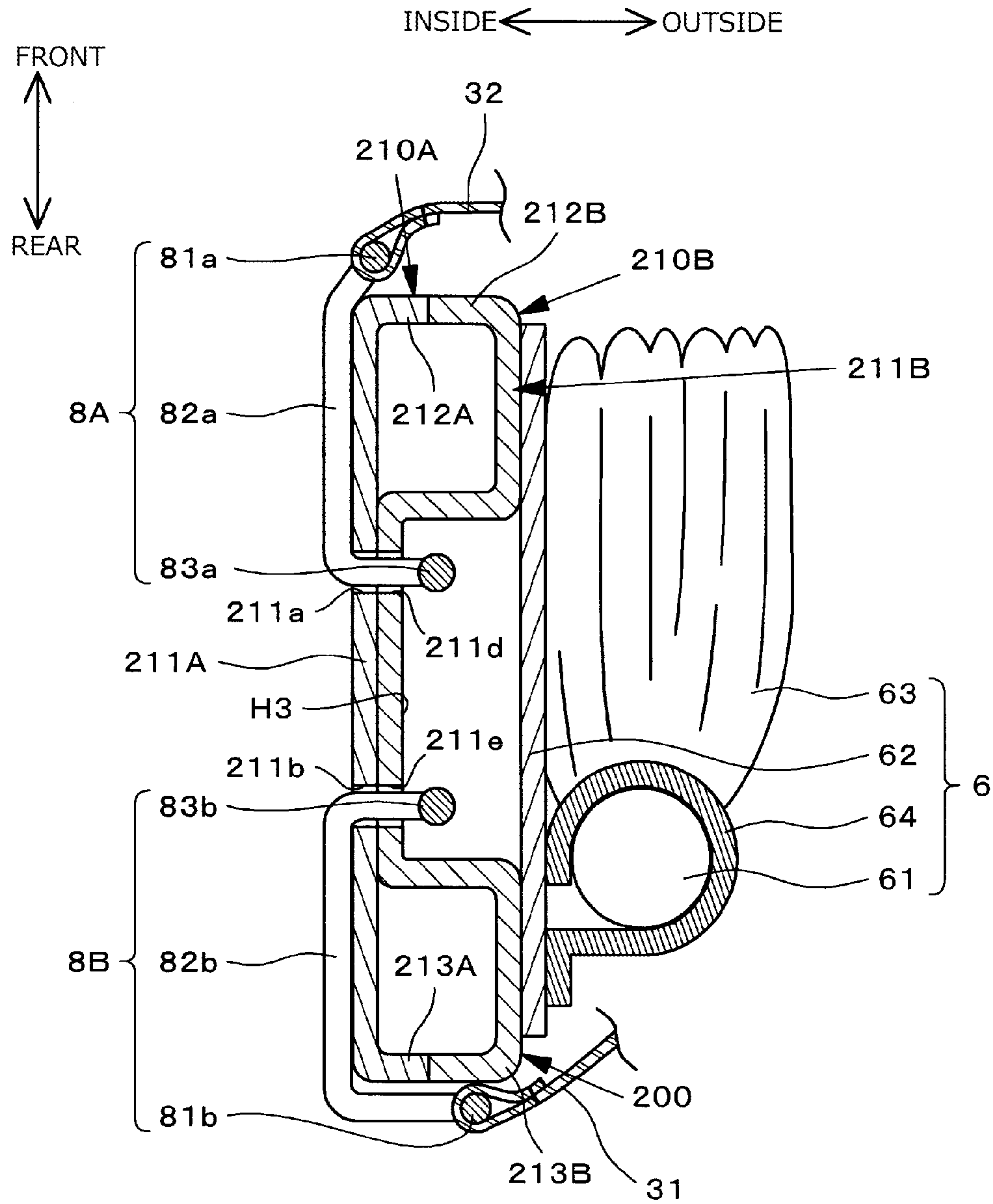


FIG. 10

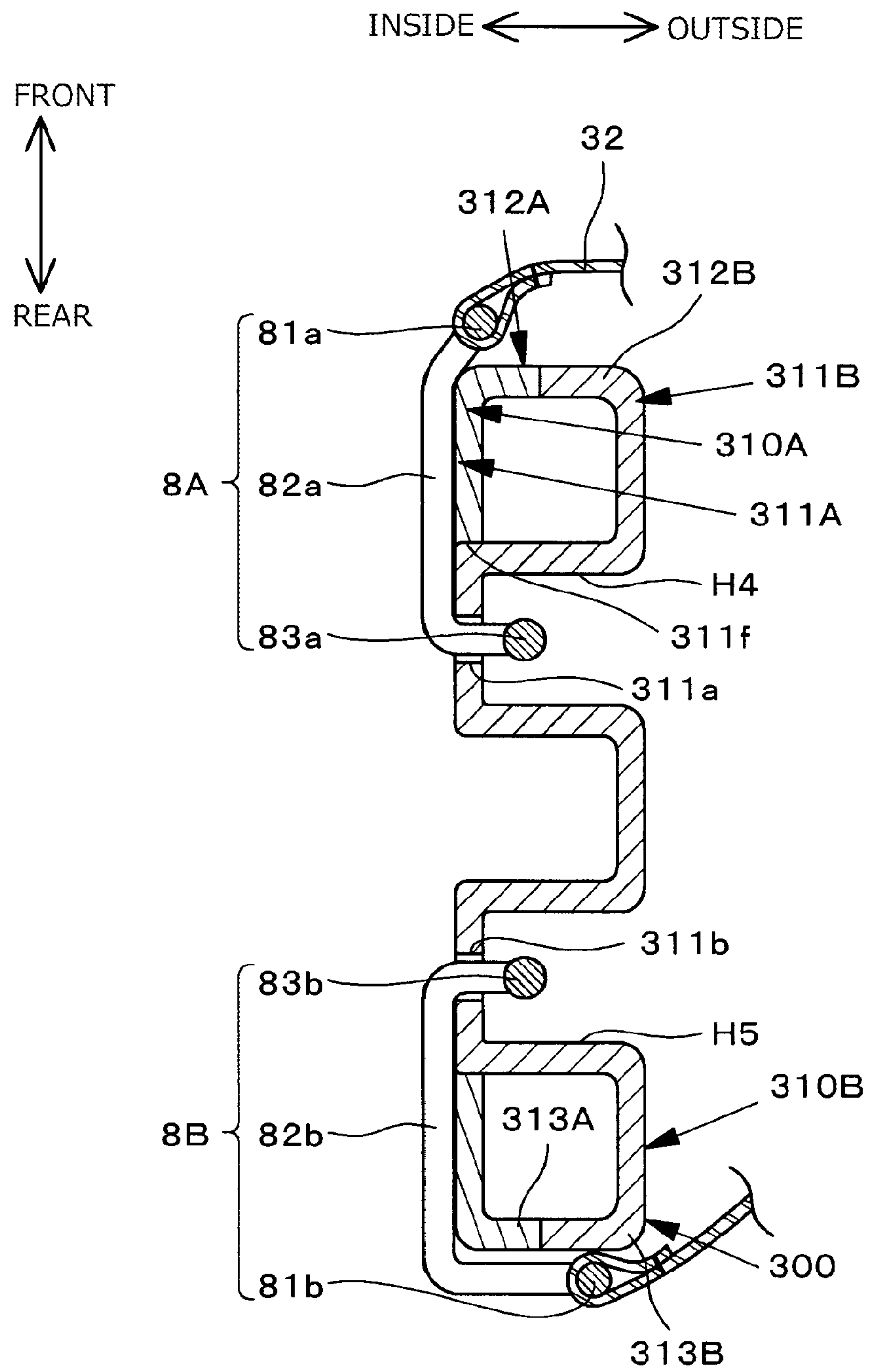


FIG. 11



**1****SEAT FRAME****CROSS REFERENCE TO RELATED APPLICATIONS**

This application is the U.S. national phase of the International Patent Application No. PCT/JP2013/058130, filed Mar. 21, 2013, which claims the benefit of the Japanese Patent Application No. 2012-067299, filed Mar. 23, 2012, the entire content being incorporated herein by reference.

**BACKGROUND**

Disclosed herein is a seat frame, and particularly, a seat frame with a guide member end attachment member that encloses an airbag module provided in a side portion of a seat back and locks a guide member for facilitating the deployment of an airbag.

Hitherto, as an airbag module equipped seat, there has been proposed a seat in which an airbag module is attached to a side frame of a seat back frame, ends of a trim cover and one-side ends of two stay cloths are sewn together to form a fracture portion of the trim cover, the airbag module is enclosed by two stay cloths drawn into the trim cover from the fracture portion, and the entire seat back including the airbag module is covered by the trim cover (for example, Japanese Patent Document No. 4452860 (“the ’860 Document”).

In the ’860 Document, two listing wires are provided at the position opposite to the airbag module of the side frame to be entangled in a ring shape. The ends of two stay cloths drawn from the fracture portion to both sides of the airbag module are respectively attached to the listing wires while being stretched to two listing wires to enclose the airbag module. A locking member is formed as a metallic bar-shaped body to stand up toward the opposite side to the airbag module of the side frame, and the two listing wires are mutually entangled and fixed while being caught by the locking member.

The locking member includes a trough bent portion which is bent in a V-shape at the position where the listing wires are locked, and the listing wires are locked to the trough bent portion so that the deviation of the listing wire from the locking member in the length direction may be prevented.

According to the invention of the ’860 Document, since the listing wire is not deviated from the locking member in the length direction, the end of the stay cloth is not deviated in the width direction during the assembly, and the airbag module is enclosed by the entire area of the stay cloth. Then, since the airbag module may be directly enclosed by the stay cloth and the stay cloth may be reliably pulled and locked by the listing wire, the expansion pressure of the airbag may be caused to efficiently concentrate on the sewn seam of the fracture portion of the trim cover by the stay cloth, and hence a high deployment performance of the airbag may be attained.

However, in the invention of the ’860 Document, the listing wire entangling and pulling position is provided at the opposite side to the airbag module of the side frame, and the locking member locking the listing wire is provided to stand up toward the opposite side to the airbag module of the side frame. Further, in order to fasten the end of one stay cloth to the side frame, there is a need to provide three wire members including two listing wires and the locking member in total.

For that reason, since the attachment position of the end of one stay cloth is enlarged, a demand for the compact

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dimension may not be satisfied. Further, since the number of components increases, manufacturing cost also increases.

Moreover, the assembling workability is poor when the number of components is large or the length of the listing wire is long.

Further, there has been a desire to improve the rigidity by decreasing the number of connection points.

**SUMMARY**

Various embodiments of the present invention are provided in view of the above-described problem, and an object addressed herein is to provide a seat frame including a guide member end attachment member having a compact periphery of a guide member attachment portion while maintaining a high deployment performance of an airbag.

Further, another object is to provide a readily-attached seat frame including a guide member end attachment member capable of realizing a strong strength.

According to a seat frame of a first embodiment, the above-described problem is solved by a seat frame in which an airbag module is disposed in a seat back frame, wherein the seat back frame is provided with a guide member end attachment member that locks an end of a guide member for facilitating deployment of an airbag provided in the airbag module, and wherein a guide member attachment position of the guide member end attachment member is disposed at an inside of the seat back frame in relation to an airbag module attachment position.

With such a configuration, the guide member may be attached to a side frame with a uniform tension by the guide member end attachment member so that the guide member is not twisted or wrinkled.

Accordingly, the expansion pressure of the airbag may efficiently concentrate on a fracture portion of a trim cover during the deployment of the airbag, and hence the high deployment performance of the airbag may be maintained.

Further, since the guide member attachment position of the guide member end attachment member is located at the inside of the seat back frame, the protrusion of the guide member toward the opposite side (the outside) of the side frame is suppressed.

Moreover, since the periphery of the guide member attachment portion may become compact, a space may be saved, and hence a decrease in size in the width direction of the seat may be realized.

In a second embodiment, the guide member end attachment member may include at least a guide member engagement portion that locks the guide member, leg portions that are respectively bent at an obtuse angle from both ends of the guide member engagement portion and extend in a same direction, and locking portions that respectively extend from front extension portions of the leg portions while being bent in a direction moving away from the guide member engagement portion, the locking portions may be locked to locking holes formed in side frames extending while being separated from each other in a width direction of the seat back frame, the airbag module may be disposed at an outside of the side frame, and the guide member engagement portion may engage with an end of the guide member at an inside of the side frame in relation to the airbag module attachment position.

With such a configuration, since the peripheral space of the side frame may be specifically saved, a decrease in size in the width direction of the seat may be realized.



Further, since the guide member end attachment member may be designed in a compact dimension, there is no need to use a long wire like, for example, the existing listing wire.

For this reason, it is less expensive.

In a third embodiment, the leg portions may be disposed to extend from the locking holes toward a front or rear side of the side frame, and the leg portions may be bent to follow a shape of a front or rear corner of the side frame.

With such a configuration, the protrusion of the guide member toward the opposite side to the side frame is suppressed, and the guide member may be stored in a compact size according to the shape of the side frame.

Accordingly, since the peripheral space of the side frame is saved, a decrease in size in the width direction of the seat may be realized.

In a fourth embodiment, a plurality of the locking portions may be locked to a plurality of the locking holes formed in the side frame, a minimal distance between the plurality of the locking portions may be set to be larger than a distance between the plurality of the locking holes, and the guide member end attachment member may be formed as a member having flexibility. Further, when the plurality of the locking portions are locked to the plurality of locking holes while a force is applied to a plurality of the leg portions so that the minimal distance between the plurality of the locking portions decreases, and the force is released, the locking portions are locked by restoration forces of the plurality of the leg portions.

With such a configuration, since the deviation of the guide member end attachment member hardly occurs and the deviation of the guide member during the non-deployment of the airbag may be suppressed, the strength increases.

Further, since the guide member end attachment member may be easily assembled, the workability is improved.

In a fifth embodiment, the side frame may be provided with an interference suppressing portion that stores the locking portion to suppress the interference with an airbag module attachment member.

Specifically, as in a sixth embodiment, the interference suppressing portion may be a hole that protrudes toward the inside of the side frame and a bottom surface of the interference suppressing portion may be provided with the locking hole. Further, a free end of the locking portion may be inserted in a direction from the inside of the side frame toward the outside thereof to be located within the interference suppressing portion.

With such a configuration, it is possible to prevent the interference between the airbag module attachment member and the locking portion constituting the guide member end attachment member, and hence to dispose the airbag module attachment member on a flat surface.

Accordingly, the entire attachment strength is improved.

According to the first embodiment, the guide member may be attached to the side frame with a uniform tension by the guide member end attachment member so that the guide member is not twisted or wrinkled. Accordingly, the expansion pressure of the airbag may efficiently concentrate on the fracture portion of the trim cover during the deployment of the airbag, and hence the high deployment performance of the airbag may be maintained.

Further, the protrusion of the guide member toward the opposite side (the outside) of the side frame is suppressed.

Moreover, since the periphery of the guide member attachment portion may become compact, a space may be saved, and hence a decrease in size in the width direction of the seat may be realized.

According to the second embodiment, since the periphery space of the side frame may be specifically saved, a decrease in size in the width direction of the seat may be realized.

Further, since the guide member end attachment member may be designed in a compact (short) dimension, it is less expensive.

According to the third embodiment, the protrusion of the guide member toward the opposite side of the side frame is suppressed, and storing the guide member may be stored in a compact size according to the shape of the side frame.

Accordingly, since the peripheral space of the side frame is saved, a decrease in size in the width direction of the seat may be realized.

According to the fourth embodiment, since the deviation of the guide member during the non-deployment of the airbag may be suppressed, the strength increases.

Further, since the guide member end attachment member may be easily assembled, the workability is improved.

According to the fifth and sixth embodiments, it is possible to prevent the interference between the airbag module attachment member and the locking portion constituting the guide member end attachment member, and hence to dispose the airbag module attachment member on a flat surface.

Accordingly, the entire attachment strength is improved.

#### BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view illustrating an appearance of an airbag module equipped seat according to an embodiment;

FIG. 2 is a perspective view illustrating a seat frame of the airbag module equipped seat according to the embodiment;

FIG. 3 is a perspective view illustrating an arrangement state of a listing wire according to the embodiment;

FIG. 4 is a cross-sectional view taken along the line A-A of FIG. 1 according to the embodiment;

FIG. 5 is a perspective view illustrating the listing wire according to the embodiment;

FIG. 6 is a perspective pictorial view illustrating an appearance of a stay cloth according to the embodiment;

FIG. 7 is a schematic view illustrating a function of the listing wire according to the embodiment;

FIG. 8 is a perspective view illustrating a side frame according to a first modified example;

FIG. 9 is a cross-sectional view illustrating a portion corresponding to the line A-A of FIG. 1 in the first modified example;

FIG. 10 is a cross-sectional view illustrating a portion corresponding to the line A-A of FIG. 1 in a second modified example; and

FIG. 11 is a cross-sectional view illustrating a portion corresponding to the line A-A of FIG. 1 in a third modified example.

#### DETAILED DESCRIPTION

Hereinafter, a seat frame F equipped with a guide member end attachment member according to an embodiment of the present invention will be described with reference to FIGS. 1 to 11.

Furthermore, the configuration described below does not limit the present invention, and may be modified into various forms within the scope of the spirit of the present invention.

As illustrated in FIG. 1, a vehicle seat S according to this embodiment includes a seat back S1, a seat portion S2, and a headrest S3.



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A seat frame F illustrated in FIG. 2 is provided in the vehicle seat S. The seat frame F includes a seat back frame 1 as a frame of the seat back S1 and a seat frame 2 as a frame of the seat portion S2.

Further, the seat frame 2 and the seat back frame 1 are connected to each other through a reclining mechanism 3.

The seat back S1 and the seat portion S2 are formed by providing a cushion and a trim cover at the outside of the seat back frame 1 and the seat frame 2.

As illustrated in FIGS. 1 to 4, the seat back S1 mainly includes the seat back frame 1, a cushion pad 5 which is placed on the seat back frame 1, a trim cover 4 which covers the seat back frame 1 and the cushion pad 5, and first and second stay cloths 31 and 32 of which one-side ends are sewn to a fracture portion 40 of the trim cover 4.

The seat back frame 1 is formed in a frame shape by including side frames 10 which are separated from each other at the right and left sides and extend in the up and down direction, an upper frame 21 which connects the upper ends of the side frames 10 to each other, and a lower frame 22 which connects the lower ends thereof to each other.

The side frame 10 is molded by performing a pressing work on a metal sheet, and has a shape formed by the combination of two plates each of which protrudes in a substantially D-shape and a front edge is bent forward as illustrated in FIGS. 1 and 2.

Hereinafter, the inner arrangement side is referred to as the "inner side frame constituting body 10A", and the outer arrangement side is referred to as the "outer side frame constituting body 10B".

The inner side frame constituting body 10A includes an inner plate 11A which has a substantial plate shape, an inner front edge 12A which is formed by folding the front end of the inner plate 11A inward in a U-shape, and an inner rear edge 13A which is formed by bending the rear end thereof inward in an L-shape.

Then, the inner front edge 12A has a structure in which the upper half portion thereof becomes an inclined portion inclined with respect to the up and down direction of the vehicle seat S so that the lower side thereof protrudes forward.

Similarly, the outer side frame constituting body 10B includes an outer plate 11B which has a substantial plate shape, an outer front edge 12B which is formed by folding the front end of the outer plate 11B inward in a U-shape, and an outer rear edge 13B which is formed by bending the rear end thereof inward in an L-shape.

Then, the outer front edge 12B has a structure in which the upper half portion thereof becomes an inclined portion inclined with respect to the up and down direction of the vehicle seat S so that the lower side thereof protrudes forward.

Then, the side frame 10 is formed by the combination of the inner side frame constituting body 10A and the outer side frame constituting body 10B when the end edge of the inner front edge 12A is bonded to the end edge of the outer front edge 12B and the end edge of the inner rear edge 13A is bonded to the end edge of the outer rear edge 13B while the inner wall of the inner plate 11A and the inner wall of the outer plate 11B face each other.

Further, in this embodiment, two front listing wire locking holes 11a and 11a are formed at the front seat side in parallel to each other in the up and down direction in the inner plate 11A constituting the inner side frame constituting body 10A.

Similarly, two rear listing wire locking holes 11b and 11b are formed at the rear seat side in parallel to each other in the up and down direction.

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The front listing wire locking holes 11a and the rear listing wire locking holes 11b correspond to the "locking holes".

Further, airbag module attachment holes 11c and 11c are formed in the inner plate 11A (at the matching positions located above and below the positions provided with the front listing wire locking holes 11a and 11a and the rear listing wire locking holes 11b and 11b).

Further, in this embodiment, the front listing wire locking holes 11a and 11a and the rear listing wire locking holes 11b and 11b are formed at substantially the same height positions.

Furthermore, since the front listing wire locking holes 11a and 11a, the rear listing wire locking holes 11b and 11b, and a listing wire 8 correspond to main components described herein, the relation, the function, the operation, and the like thereof will be described later in detail.

An existing airbag module may be used as an airbag module 6 according to this embodiment, but an example thereof will be simply described below.

The airbag module 6 includes an inflator 61, an attachment bracket 62 as an attachment member, an airbag 63, an inflator bracket 64, and the like.

The inflator 61 is attached to the attachment bracket 62 while being held by the inflator bracket 64, and the upper end of the inflator 61 is inserted into the airbag 63.

Further, the base portion of the airbag 63 is attached to the inflator bracket 64.

Furthermore, the inflator bracket 64 is a cylindrical member, and the inflator 61 is inserted therein to be held therein.

Then, the attachment bracket 62 to which these components are directly and indirectly attached are attached to the outer surface (the surface facing the opposite side to the seat surface arrangement position) of the outer plate 11B constituting the side frame 10.

Although not illustrated in the drawings, the attachment bracket 62 is provided with two bolt holes which may communicate with the airbag module attachment holes 11c and 11c in a matching state, and the attachment bracket 62 is fixed to the side frame 10 by threading bolts V from the communication holes.

Although a harness and a connector necessary to configure related equipment, such as an impact sensor and a circuit configuration, are arranged therearound, the arrangement method and the arrangement position thereof will not be described, since an existing technique is used.

When a large load is applied from the outside of the vehicle body door into the vehicle body (in the event of a so-called "lateral collision") so that various sensors output corresponding signals, the airbag module 6 with such a configuration is deployed in the seat outer direction (toward the lateral side of the occupant) while a gas is discharged from the inflator 61 to expand the airbag 63.

Furthermore, in this embodiment, a configuration example of a so-called "caseless airbag module" in which the attachment bracket 62 provided with the inflator 61 and the like is attached to the side frame 10 has been described.

However, the present invention is not limited thereto, and a configuration may be employed in which the entire airbag module is stored in a module case while the fastening bolt of the attachment bracket 62 is exposed to the outside.

In this case, an example of the module case may have a structure in which an openable and closeable lid is connected to a case body through a hinge or a structure in which a housing is formed by a lower plate and a case body having a fragile portion such as a V-groove provided in a front



surface thereof. Thus, the module case may be opened by the expansion pressure of the airbag.

The upper frame **21** is provided with a pillar support portion **23**, and the pillar support portion **23** is provided with a headrest frame (not illustrated). The headrest **S3** is formed by providing a cushion member at the outside of the headrest frame.

As illustrated in FIG. **4**, the cushion pad **5** is provided with a space **7** which is used to store the airbag module **6**.

The trim cover **4** is formed of an existing material, and is sewn in a bag shape by sewing a front surface gusset portion **41** enclosing right and left bank surfaces from the center of the seat surface and a side surface gusset portion **42** reaching a back surface from a peripheral surface and further connecting a back surface gusset portion (not illustrated) to the side surface gusset portion **42** to be openable and closeable by a slider fastener (not illustrated) as illustrated in FIG. **4**.

The trim cover **4** is provided with the fracture portion **40** which is formed at the expansion peak points of the bank portions of the front surface gusset portion **41** and the side surface gusset portion **42**. The fracture portion **40** sews the ends of the front surface gusset portion **41** and the side surface gusset portion **42** to each other so that the fracture portion may be broken by a tensile force generated by the expansion of the airbag **63** while the strength endurable for the normal use is maintained.

The first stay cloth **31** and the second stay cloth **32** are formed of a less stretchable cloth material, and are used to transmit a stress generated by the expansion of the airbag **63** to the fracture portion **40**.

In more detail, the first stay cloth **31** and the second stay cloth **32** are formed as sheet-shaped members having a stretchable property smaller than the trim cover **4**, and one-side ends thereof are sewn to the fracture portion **40** formed in the vicinity of the storage place for the airbag module **6** so that a force generated when the airbag **63** is deployed and expanded is transmitted to the fracture portion **40**.

Then, the stay cloths are disposed between the airbag module **6** and the other component so that the other component such as the cushion pad **5** is not broken by a force that promotes the deployment of the airbag **63** and a force that is generated by the expansion force during the deployment of the airbag **63**.

The first stay cloth **31** and the second stay cloth **32** correspond to the "guide member". Specifically, the first and second stay cloths serve as the deployment promotion guide member for the airbag **63**.

Furthermore, the "guide member" is not limited to the cloth material exemplified as the first stay cloth **31** and the second stay cloth **32** as long as the above-described function is accomplished, and may be arbitrarily selected within the scope without departing from the spirit of the present invention.

Moreover, the shape and the configuration of the "guide member" are not limited to those exemplified in the first stay cloth **31** and the second stay cloth **32**, and may be arbitrarily designed within the scope without departing from the spirit of the present invention as long as the above-described function is accomplished.

Then, the first and second stay cloths are disposed between the airbag module **6** and the other component so that the other component such as the cushion pad **5** is not broken by a force that promotes the deployment of the airbag **63** and a force that is generated by the expansion force during the deployment of the airbag **63**.

As illustrated in FIGS. **4** and **6**, the first stay cloth **31** is formed by a substantially rectangular cloth which is elongated in the tensile force application direction, and one-side end thereof is sewn to all of the ends of the front surface gusset portion **41** and the side surface gusset portion **42** of the trim cover **4** and one-side end of the second stay cloth **32** by the fracture portion **40**.

At the other-side end of the first stay cloth **31**, the end thereof is folded and sewn together in a loop shape in the length direction, and the listing wire **8** (the rear listing wire **8B**) is inserted through the sewn loop.

As illustrated in FIG. **6**, the second stay cloth **32** is formed by a substantially trapezoid cloth in which an edge **34** near the fracture portion **40** is elongated while the edge **34** near the fracture portion **40** and an edge **35** opposite to the fracture portion **40** are substantially parallel to each other.

One edge **38** of two edges connecting the edge **34** near the fracture portion **40** and the edge **35** opposite to the fracture portion **40** is formed as an edge which is inclined with respect to the edge **34** near the fracture portion **40** and the edge **35** opposite to the fracture portion **40** so that the upper half portion of the front edge **12** of the side frame **10** follows the shape of the inclined portion which protrudes to be inclined forward in a direction from the upside toward the downside.

The end of the edge **35** is folded and sewn together in a loop shape in the length direction, and the listing wire **8** (the front listing wire **8A**) is inserted through the sewn loop.

As illustrated in FIG. **5**, the listing wire **8** according to this embodiment is a member that is formed by bending a hard wire such as a hard steel wire and a piano wire.

Hereinafter, the listing wire **8** which is disposed at the front side of the seat and locks the second stay cloth **32** is referred to as the "front listing wire **8A**", and the listing wire **8** which is disposed at the rear side of the seat and locks the first stay cloth **31** is referred to as the "rear listing wire **8B**".

The front listing wire **8A** includes a front stay cloth engagement portion **81a** as a guide member engagement portion, two front leg portions **82a** and **82a**, and two front locking portions **83a** and **83a**.

The front leg portions **82a** and **82a** extend from both ends of the front stay cloth engagement portion **81a** having a substantially linear shape while forming an obtuse angle.

The front leg portion **82a** is formed to follow the front corner of the inner side frame constituting body **10A**.

Further, the front locking portions **83a** and **83a** extend outward (in a direction opposite to the extension direction of the front stay cloth engagement portion **81a**) from one-side ends of the front leg portions **82a** and **82a** (the ends opposite to the continuous side with respect to the front stay cloth engagement portion **81a**) to be substantially parallel to the front stay cloth engagement portion **81a**.

The rear listing wire **8B** includes a rear stay cloth engagement portion **81b** as a guide member engagement portion, two rear leg portions **82b** and **82b**, and two rear locking portions **83b** and **83b**.

The shape of the rear listing wire **8B** is the same as the front listing wire **8A** except that the rear leg portions **82b** and **82b** extend in a substantially perpendicular direction from both ends of the rear stay cloth engagement portion **81b** having a substantially linear shape.

That is, the same configuration is employed except that the angle formed between the rear stay cloth engagement portion **81b** and the rear leg portion **82b** is smaller than the



angle formed between the front stay cloth engagement portion **81a** and the front leg portion **82a**.

The mechanism of the listing wire **8** will be described.

Since the front listing wire **8A** and the rear listing wire **8B** are formed in the same way, the front listing wire **8A** will be representatively described.

As illustrated in FIG. 7, the front listing wire **8A** is formed so that an obtuse angle  $\alpha^\circ$  is formed between the front stay cloth engagement portion **81a** and each of the front leg portions **82a** and **82a** as indicated by the solid line in a state where no force is generated (hereinafter, this state will be referred to as the "free state").

Then, the front listing wire **8A** is formed so that the continuous portion (the boundary portion) between the front stay cloth engagement portion **81a** and each of the front leg portions **82a** and **82a** is deflected about each of the pivot points P and P (hereinafter, this state will be referred to as the "set state").

The front listing wire may be formed to obtain flexibility by adjusting the hardness of the material and the diameter.

That is, when an action force F is applied in a direction in which the front leg portions **82a** and **82a** approach each other, the front leg portions **82a** and **82a** are deflected about the pivot points P and P by the flexibility in a direction in which the front leg portions **82a** and **82a** approach each other.

For example, when the front locking portions **83a** and **83a** are inserted into two locking portions formed in an elongated hole shape while this state is maintained and the front listing wire is returned to the free state, the front listing wire is locked due to the existence of the front locking portions **83a** and **83a** at the two locking portions. Accordingly, it is possible to effectively prevent the unintentional release of the locking state of the front listing wire **8A**.

In this way, the inner corner portions which are formed by the front leg portions **82a** and **82a** and the front locking portions **83a** and **83a** are reliably locked to two locking portions.

Further, the set state may be automatically returned to the free state by adjusting the material and the diameter of the front listing wire **8A**.

For example, if the hardness of the front listing wire **8A** is high to a certain degree, the front leg portions **82a** and **82a** which are displaced from the free state to the set state are automatically returned to the free state when the action force G is released by the restoration force.

Accordingly, for example, when the front locking portions **83a** and **83a** are inserted into two locking portions formed in an elongated hole shape while the set state is maintained and the action force G is released, the shape is biased to return to the original shape by a restoration force G'. For this reason, the inner corner portions which are formed by the front leg portions **82a** and **82a** and the front locking portions **83a** and **83a** are reliably locked to the ends of the locking portions.

Further, when the inner corner portions are locked to two locking portions by setting the distance between two locking portions to be slightly shorter than the distance between both inner corner portions formed by the front leg portions **82a** and **82a** and the front locking portions **83a** and **83a**, the restoration force G' acts on the locking portions in a direction in which the front leg portions **82a** and **82a** are separated from each other. For this reason, the front leg portions **82a** and **82a** are reliably locked to the locking portions by the restoration force G'.

Since the front locking portions **83a** and **83a** exist in this state, it is possible to effectively prevent the unintentional release of the locking state of the front listing wire **8A** due to the locking operation.

#### 5 Configuration and Mechanism of Listing Wire

Next, the relation among the listing wire **8**, the side frame **10**, the first stay cloth **31**, and the second stay cloth **32** will be described with reference to FIGS. 4 to 7.

First, the edge **35** constituting the second stay cloth **32** is formed so that the end thereof is folded and sewn together in a loop shape in the length direction as described above, and the front stay cloth engagement portion **81a** of the front listing wire **8A** is inserted through the sewn loop.

Similarly, the free end of the first stay cloth **31** is formed so that the end thereof is folded and sewn together in a loop shape in the length direction as described above, and the rear stay cloth engagement portion **81b** of the rear listing wire **8B** is inserted through the sewn loop.

In this state, the action force G is applied to the front listing wire **8A** and the rear listing wire **8B** to change the current state from the free state to the set state.

Next, the front locking portions **83a** and **83a** constituting the front listing wire **8A** are inserted into the front listing wire locking holes **11a** and **11a** to return the current state to the free state.

In this way, the front listing wire **8A** is attached to the front listing wire locking holes **11a** and **11a** by locking the inner corner portions which are formed by the front leg portions **82a** and **82a** and the front locking portions **83a** and **83a** to the front listing wire locking holes **11a** and **11a**.

The front listing wire **8A** is disposed so that the front stay cloth engagement portion **81a** protrudes toward the front side in relation to the inner side frame constituting body **10A** and the front leg portion **82a** follows the front corner of the inner side frame constituting body **10A** by the bent shape thereof.

Accordingly, the second stay cloth **32** is attached to the side frame **10** through the front listing wire **8A** while the end attached to the front stay cloth engagement portion **81a** is located at the front side of the side frame **10**.

Similarly, the rear locking portions **83b** and **83b** constituting the rear listing wire **8B** are inserted into the rear listing wire locking holes **11b** and **11b** to return the current state to the free state.

In this way, the rear listing wire **8B** is attached to the rear listing wire locking holes **11b** and **11b** by locking the inner corner portions formed by the rear leg portions **82b** and **82b** and the rear locking portions **83b** and **83b** to the rear listing wire locking holes **11b** and **11b**.

The rear listing wire **8B** is disposed so that the rear stay cloth engagement portion **81b** protrudes toward the rear side in relation to the inner side frame constituting body **10A** and the rear leg portion **82b** follows the rear corner of the inner side frame constituting body **10A** by the bent shape thereof.

Accordingly, the first stay cloth **31** is attached to the side frame **10** through the rear listing wire **8B** while the end attached to the rear stay cloth engagement portion **81b** is located at the rear side of the side frame **10**.

The positional relation among the front listing wire **8A**, the rear listing wire **8B**, the first stay cloth **31**, the second stay cloth **32**, and the airbag module **6** attached in this way will be described with reference to FIG. 4.

One-side end of the first stay cloth **31** is sutured and fixed to the fracture portion **40** while passing through the outside of the airbag module **6**, and the other-side end thereof is attached to the rear side of the side frame **10** through the rear listing wire **8B**.



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Further, one-side end of the second stay cloth **32** is sutured and fixed to the fracture portion **40** while passing through the front side of the airbag module **6**, and the other-side end thereof is attached to the front side of the side frame **10** through the front listing wire **8A**.

As described above, according to this embodiment, it is possible to simply and reliably attach the end of the first stay cloth **31** and the end of the second stay cloth **32** to the side frame **10** by using the listing wire **8** having a simple structure.

Accordingly, the configuration may be simplified, and the components may be disposed without disturbing the function of the airbag module **6**.

Further, according to this embodiment, the listing wire **8** has a structure shorter and simpler than the existing listing wire.

For this reason, an attachment may be easily performed, and an advantage in cost may be obtained.

Further, in this embodiment, the side frame **10** is formed in a shape in which two bodies are combined with each other. In such a structure, the bonding surface may be increased in area, and hence the rigidity thereof is improved.

Furthermore, the first modified example below shows an available application example of the present invention when the side frame **10** is formed as a single body.

## First Modified Example

Next, a modified example of the side frame **10** will be described with reference to FIGS. **8** and **9**.

In this example, a second side frame **100** is used, and the other configurations will not be described in that the configurations are the same as those of the above-described embodiment.

The side frame **10** of the above-described embodiment is formed by the combination of the inner side frame constituting body **10A** and the outer side frame constituting body **10B**, but the second side frame **100** of this example is a single body including only a second outer side frame constituting body **110B**.

Furthermore, in this example, the second side frame **100** is the same as the second outer side frame constituting body **110B**. In order to easily and clearly compare the above-described embodiment and the modified examples to be described below (including the consistency of reference numerals), the second side frame will be described as the "second outer side frame constituting body **110B**" in the description below.

In brief, the second outer side frame constituting body **110B** includes a second outer plate **111B** which has a substantial plate shape, a second outer front edge **112B** which is formed by folding the front end of the second outer plate **111B** inward in a U-shape, and a second outer rear edge **113B** which is formed by bending the rear end thereof inward in an L-shape.

Then, the second outer front edge **112B** has a structure in which the upper half portion thereof becomes an inclined portion inclined with respect to the up and down direction of the vehicle seat **S** so that the lower side thereof protrudes forward.

Further, the second outer plate **111B** is provided with two second front concave portions **H1** and **H1** which are formed at the front side of the seat in parallel to each other in the up and down direction.

The second front concave portion **H1** corresponds to the "interference suppressing portion".

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The second front concave portion **H1** is formed to protrude toward the inside of the second outer side frame constituting body **110B** (that is, the seat inner direction: the bending side of the second outer front edge **112B** and the second outer rear edge **113B**), and a convex portion and a convex edge are not formed at the outside of the second outer side frame constituting body **110B**.

Then, the bottom portions of the two second front concave portions **H1** and **H1** are respectively provided with second front listing wire locking holes **111a** and **111a** as locking holes.

Similarly, the second outer plate **111B** is provided with two second rear concave portions **H2** and **H2** which are formed as the interference suppressing portions at the rear side of the seat in parallel to each other in the up and down direction.

The second rear concave portion **H2** is formed to protrude toward the inside of the second outer side frame constituting body **110B** (that is, the bending side of the seat inner direction: the second outer front edge **112B** and the second outer rear edge **113B**), and the outside of the second outer side frame constituting body **110B** is not provided with a convex portion and a convex edge.

Then, the bottom portions of the two second rear concave portions **H2** and **H2** are respectively provided with second rear listing wire locking holes **111b** and **111b** as the locking holes.

Further, in this embodiment, the second front listing wire locking holes **111a** and **111a** (the second front concave portions **H1** and **H1**) and the second rear listing wire locking holes **111b** and **111b** (the second rear concave portions **H2** and **H2**) are disposed at substantially the same height position.

The attachment structure of the second outer side frame constituting body **110B**, the airbag module **6**, and the listing wire **8** with such a configuration will be described with reference to FIG. **9**.

As described above, the second front concave portion **H1** and the second rear concave portion **H2** are formed in a shape in which a convex portion and a convex edge are not formed at the outside of the second outer side frame constituting body **110B**.

That is, the outer surface (i.e., the seat outer direction: the opposite side to the bending side of the second outer front edge **112B** and the second outer rear edge **113B**) of the second outer side frame constituting body **110B** is not provided with a portion protruding in the seat outer direction, and hence the attachment bracket **62** may be provided in a flat state.

Then, the front listing wire **8A** and the rear listing wire **8B** are attached to the second outer side frame constituting body **110B**.

That is, the front listing wire **8A** is attached to the second front listing wire locking holes **111a** and **111a** by locking the inner corner portions formed by the front leg portions **82a** and **82a** and the front locking portions **83a** and **83a** to the second front listing wire locking holes **111a** and **111a**.

The front listing wire **8A** is disposed so that the front stay cloth engagement portion **81a** protrudes toward the front side in relation to the second outer side frame constituting body **110B** and the front leg portion **82a** follows the front shape of the second outer side frame constituting body **110B** by the bent shape thereof.

Accordingly, the second stay cloth **32** is attached to the second outer side frame constituting body **110B** through the front listing wire **8A** while the end attached to the front stay



cloth engagement portion **81a** is located at the front side of the second outer side frame constituting body **110B**.

Similarly, the rear listing wire **8B** is attached to the second rear listing wire locking holes **111b** and **111b** by locking the inner corner portions formed by the rear leg portions **82b** and **82b** and the rear locking portions **83b** and **83b** to the second rear listing wire locking holes **111b** and **111b**.

The rear listing wire **8B** is disposed so that the rear stay cloth engagement portion **81b** protrudes toward the rear side in relation to the second outer side frame constituting body **110B** and the rear leg portion **82b** follows the rear shape of the second outer side frame constituting body **110B** by the bent shape thereof.

Accordingly, the first stay cloth **31** is attached to the second outer side frame constituting body **110B** through the rear listing wire **8B** while the end attached to the rear stay cloth engagement portion **81b** is located at the rear side of the second outer side frame constituting body **110B**.

Further, in this example, since the front locking portions **83a** and **83a** are stored in the second front concave portions **H1** and **H1** and the rear locking portions **83b** and **83b** are stored in the second rear concave portions **H2** and **H2**, the front locking portions **83a** and **83a** and the rear locking portions **83b** and **83b** do not protrude toward the outer surface of the second outer side frame constituting body **110B**.

For this reason, it is possible to place and fix the attachment bracket **62** to the outer surface of the second outer side frame constituting body **110B** in a flat state.

Accordingly, even when the second side frame **100** is formed as the single second outer side frame constituting body **110B**, it is possible to effectively prevent the interference between the listing wire **8** and the airbag module **6** (the attachment bracket **62**).

#### Second Modified Example

Next, a modified example of the side frame **10** will be described with reference to FIG. **10**.

In this example, a third side frame **200** is used, and the other configurations will not be described in that the configurations are the same as those of the above-described embodiment.

The third side frame **200** of this example is formed by the combination of a third inner side frame constituting body **210A** and a third outer side frame constituting body **210B**.

The third inner side frame constituting body **210A** includes a third inner plate **211A** which has a substantial plate shape, a third inner front edge **212A** which is formed by folding the front end of the third inner plate **211A** inward in a U-shape, and a third inner rear edge **213A** which is formed by bending the rear end thereof inward in an L-shape.

Then, the third inner front edge **212A** has a structure in which the upper half portion thereof becomes an inclined portion inclined with respect to the up and down direction of the vehicle seat **S** so that the lower side thereof protrudes forward.

Similarly, the third outer side frame constituting body **210B** includes a third outer plate **211B** which has a substantial plate shape, a third outer front edge **212B** which is formed by folding the front end of the third outer plate **211B** inward in a U-shape, and a third outer rear edge **213B** which is formed by bending the rear end thereof inward in an L-shape.

Then, the third outer front edge **212B** has a structure in which the upper half portion thereof becomes an inclined

portion inclined with respect to the up and down direction of the vehicle seat **S** so that the lower side thereof protrudes forward.

Then, the third side frame **200** is formed by the combination of the third inner side frame constituting body **210A** and the third outer side frame constituting body **210B** when the end edge of the third inner front edge **212A** is bonded to the end edge of the third outer front edge **212B** and the end edge of the third inner rear edge **213A** is bonded to the end edge of the third outer rear edge **213B** while the inner wall of the third inner plate **211A** faces the inner wall of the third outer plate **211B**.

Further, in this example, two third inner front listing wire locking holes **211a** and **211a** are formed as the locking holes at the front side of the seat in parallel to each other in the up and down direction in the third inner plate **211A** constituting the third inner side frame constituting body **210A**.

Similarly, two third inner rear listing wire locking holes **211b** and **211b** are formed as the locking holes at the rear side of the seat in parallel to each other in the up and down direction.

Moreover, in this example, the third outer plate **211B** constituting the third outer side frame constituting body **210B** is provided with a third concave portion **H3** which is formed as the interference suppressing portion.

The third concave portion is formed in the vicinity of the substantial center of the third concave portion **H3** in the width direction of the seat to protrude toward the inside of the third outer side frame constituting body **210B** (that is, the bending side of the seat inner direction: the third outer front edge **212B** and the third outer rear edge **213B**), and the outside of the third outer side frame constituting body **210B** is not provided with a convex portion and a convex edge.

Then, the bottom portion of the third concave portion **H3** is provided with third outer front listing wire locking holes **211d** and **211d** as the locking holes and third outer rear listing wire locking holes **211e** and **211e** as the locking holes.

Furthermore, the third concave portion **H3** may be divided into a third upper concave portion **H31** and a third lower concave portion **H32**, the third outer front listing wire locking hole **211d** located at the upside and the third outer rear listing wire locking hole **211e** located at the upside may be formed at the bottom portion of the third upper concave portion **H31**, and the third outer front listing wire locking hole **211d** located at the downside and the third outer rear listing wire locking hole **211e** located at the downside may be formed at the bottom portion of the third lower concave portion **H32**.

Furthermore, when the third inner side frame constituting body **210A** and the third outer side frame constituting body **210B** are combined with each other, the outer surface of the bottom surface of the third concave portion **H3** formed in the third outer side frame constituting body **210B** and the inner wall surface of the third inner side frame constituting body **210A** matching the position are close to each other or contact each other. In this state, the third inner front listing wire locking holes **211a** and **211a** and the third inner rear listing wire locking holes **211b** and **211b** respectively communicate with the third outer front listing wire locking holes **211d** and **211d** and the third outer rear listing wire locking holes **211e** and **211e**, and the listing wire **8** is inserted through the communication holes.

That is, the listing wire **8** is formed to penetrate a position where the third inner side frame constituting body **210A** and the third outer side frame constituting body **210B** are closest to each other.



Hereinafter, the communication holes (two communication holes) of the third inner front listing wire locking holes **211a** and **211a** with respect to the third outer front listing wire locking holes **211d** and **211d** are referred to as the “front communication holes R1”, and the communication holes (two communication holes) of the third inner rear listing wire locking holes **211b** and **211b** with respect to the third outer rear listing wire locking holes **211e** and **211e** are referred to as the “rear communication holes R2”.

The attachment structure of the third outer side frame constituting body **210B**, the airbag module **6**, and the listing wire **8** with such a configuration will be described.

As described above, the third concave portion H3 is formed in a shape in which a convex portion and a convex edge are not formed at the outside of the third outer side frame constituting body **210B**.

That is, the outer surface (i.e., the opposite side to the bending side of the seat outer direction: the third outer front edge **212B** and the third outer rear edge **213B**) of the third outer side frame constituting body **210B** is not provided with a protruding portion in the seat outer direction, and hence the attachment bracket **62** may be provided in a flat state.

Then, the front listing wire **8A** and the rear listing wire **8B** are attached to the third outer side frame constituting body **210B**.

That is, the front listing wire **8A** is attached to the front communication holes R1 and R1 by locking the inner corner portions formed by the front leg portions **82a** and **82a** and the front locking portions **83a** and **83a** to the front communication holes R1 and R1.

The front listing wire **8A** is disposed so that the front stay cloth engagement portion **81a** protrudes toward the front side in relation to the third side frame **200** and the front leg portion **82a** follows the front shape of the third side frame **200** by the bent shape thereof.

Accordingly, the second stay cloth **32** is attached to the third side frame **200** through the front listing wire **8A** while the end attached to the front stay cloth engagement portion **81a** is located at the front side of the third side frame **200**.

Similarly, the rear listing wire **8B** is attached to the rear communication holes R2 and R2 by locking the inner corner portions formed by the rear leg portions **82b** and **82b** and the rear locking portions **83b** and **83b** to the rear communication holes R2 and R2.

The rear listing wire **8B** is disposed so that the rear stay cloth engagement portion **81b** protrudes toward the rear side in relation to the third side frame **200** and the rear leg portion **82b** follows the rear shape of the third side frame **200** by the bent shape thereof.

Accordingly, the first stay cloth **31** is attached to the third side frame **200** through the rear listing wire **8B** while the end attached to the rear stay cloth engagement portion **81b** is located at the rear side of the third side frame **200**.

Further, in this example, since the front locking portions **83a** and **83a** and the rear locking portions **83b** and **83b** are stored in the third concave portion H3, the front locking portions **83a** and **83a** and the rear locking portions **83b** and **83b** do not protrude toward the outer surface of the third outer side frame constituting body **210B**.

For this reason, it is possible to place and fix the attachment bracket **62** to the outer surface of the third outer side frame constituting body **210B** in a flat state.

Accordingly, it is possible to effectively prevent the interference between the listing wire **8** and the airbag module **6** (the attachment bracket **62**).

Next, a modified example of the side frame **10** will be described with reference to FIG. **11**.

In this example, a fourth side frame **300** is used, and the other configurations will not be described in that the configurations are the same as those of the above-described embodiment.

The fourth side frame **300** of this example is formed by the combination of a fourth inner side frame constituting body **310A** and a fourth outer side frame constituting body **310B**.

The fourth inner side frame constituting body **310A** includes a fourth inner plate **311A** which has a substantial plate shape, a fourth inner front edge **312A** which is formed by folding the front end of the fourth inner plate **311A** inward in a U-shape, and a fourth inner rear edge **313A** which is formed by bending the rear end thereof inward in an L-shape.

Further, the fourth inner front edge **312A** has a structure in which the upper half portion thereof becomes an inclined portion inclined with respect to the up and down direction of the vehicle seat S so that the lower side thereof protrudes forward.

Similarly, the fourth outer side frame constituting body **310B** includes a fourth outer plate **311B** which has a substantial plate shape, a fourth outer front edge **312B** which is formed by folding the front end of the fourth outer plate **311B** inward in a U-shape, and a fourth outer rear edge **313B** which is formed by bending the rear end thereof inward in an L-shape.

Further, the fourth outer front edge **312B** has a structure in which the upper half portion thereof becomes an inclined portion inclined with respect to the up and down direction of the vehicle seat S so that the lower side thereof protrudes forward.

Then, the fourth side frame **300** is formed by the combination of the fourth inner side frame constituting body **310A** and the fourth outer side frame constituting body **310B** when the end edge of the fourth inner front edge **312A** is bonded to the end edge of the fourth outer front edge **312B** and the end edge of the fourth inner rear edge **313A** is bonded to the end edge of the fourth outer rear edge **313B** while the inner wall of the fourth inner plate **311A** and the inner wall of the fourth outer plate **311B** face each other.

Further, in this example, an engagement hole **311f** is formed at the arrangement position of the listing wire **8** of the fourth inner plate **311A** constituting the fourth inner side frame constituting body **310A**.

Furthermore, in this example, the fourth outer plate **311B** constituting the fourth outer side frame constituting body **310B** is provided with two fourth front concave portions H4 and H4 which are formed as the interference suppressing portions at the front side of the seat in parallel to each other in the up and down direction.

The fourth front concave portion H4 is formed to protrude toward the inside of the fourth outer side frame constituting body **310B** (that is, the seat inner direction: the bending side of the fourth outer front edge **312B** and the fourth outer rear edge **313B**), and the outside of the fourth outer side frame constituting body **310B** is not provided with a convex portion and a convex edge.

Then, the bottom portions of two fourth front concave portions H4 and H4 are respectively provided with fourth front listing wire locking holes **311a** and **311a** as the locking holes.



Similarly, the fourth outer plate **311B** is provided with two fourth rear concave portions **H5** and **H5** which are formed as the interference suppressing portions at the rear side of the seat in parallel to each other in the up and down direction.

The fourth rear concave portion **H5** is formed to protrude toward the inside of the fourth outer side frame constituting body **310B** (that is, the seat inner direction: the bending side of the fourth outer front edge **312B** and the fourth outer rear edge **313B**), and the outside of the fourth outer side frame constituting body **310B** is not provided with a convex portion and a convex edge.

Then, the bottom portions of two fourth rear concave portions **H5** and **H5** are respectively provided with fourth rear listing wire locking holes **311b** and **311b** as the locking holes.

Further, the fourth front concave portions **H4** and **H4** and the fourth rear concave portions **H5** and **H5** engage with the engagement holes **311f**.

That is, the front side wall portions of the fourth front concave portions **H4** and **H4** and the rear side wall portions of the fourth rear concave portions **H5** and **H5** are formed to respectively engage with the front inner peripheral edge and the rear inner peripheral edge of the engagement hole **311f**.

Then, in this state, the fourth front listing wire locking holes **311a** and **311a** and the fourth rear listing wire locking holes **311b** and **311b** are exposed in the seat inner direction.

That is, the fourth front and rear listing wire locking holes are exposed to the seat inner surface of the fourth inner side frame constituting body **310A**.

Next, the attachment structure of the fourth outer side frame constituting body **310B**, the airbag module **6**, and the listing wire **8** with such a configuration will be described.

As described above, the fourth front concave portion **H4** and the fourth rear concave portion **H5** are formed in a shape in which a convex portion and a convex edge are not formed at the outside of the fourth outer side frame constituting body **310B**.

That is, the outer surface (that is, the seat outer direction: the opposite side to the bending side of the fourth outer front edge **312B** and the fourth outer rear edge **313B**) of the fourth outer side frame constituting body **310B** is not provided with a protruding portion in the seat outer direction, and hence the attachment bracket **62** may be provided in a flat state.

Then, the front listing wire **8A** and the rear listing wire **8B** are attached to the fourth outer side frame constituting body **310B**.

That is, the front listing wire **8A** is attached to the fourth front listing wire locking holes **311a** and **311a** by locking the inner corner portions formed by the front leg portions **82a** and **82a** and the front locking portions **83a** and **83a** to the fourth front listing wire locking holes **311a** and **311a**.

The front listing wire **8A** is disposed so that the front stay cloth engagement portion **81a** protrudes toward the front side in relation to the fourth outer side frame constituting body **310B** and the front leg portion **82a** follows the front shape of the fourth outer side frame constituting body **310B** by the bent shape thereof.

Accordingly, the second stay cloth **32** is attached to the fourth outer side frame constituting body **310B** through the front listing wire **8A** while the end attached to the front stay cloth engagement portion **81a** is located at the front side of the fourth outer side frame constituting body **310B**.

Similarly, the rear listing wire **8B** is attached to the fourth rear listing wire locking holes **311b** and **311b** by locking the inner corner portions formed by the rear leg portions **82b** and **82b** and the rear locking portions **83b** and **83b** to the fourth rear listing wire locking holes **311b** and **311b**.

The rear listing wire **8B** is disposed so that the rear stay cloth engagement portion **81b** protrudes toward the rear side in relation to the fourth outer side frame constituting body **310B** and the rear leg portion **82b** follows the rear shape of the fourth outer side frame constituting body **310B** by the bent shape thereof.

Accordingly, the first stay cloth **31** is attached to the fourth outer side frame constituting body **310B** through the rear listing wire **8B** while the end attached to the rear stay cloth engagement portion **81b** is located at the rear side of the fourth outer side frame constituting body **310B**.

Further, in this example, since the front locking portions **83a** and **83a** are stored in the fourth front concave portions **H4** and **H4** and the rear locking portions **83b** and **83b** are stored in the fourth rear concave portions **H5** and **H5**, the front locking portions **83a** and **83a** and the rear locking portions **83b** and **83b** do not protrude toward the outer surface of the fourth outer side frame constituting body **310B**.

For this reason, it is possible to place and fix the attachment bracket **62** to the outer surface of the fourth outer side frame constituting body **310B** in a flat state.

Accordingly, it is possible to effectively prevent the interference between the listing wire **8** and the airbag module **6** (the attachment bracket **62**).

## REFERENCE SIGNS LIST

|    |   |
|----|---|
| 30 | S vehicle seat  |
|    | S1 seat back  |
|    | S2 seat portion   |
|    | S3 headrest   |
|    | F seat frame  |
| 35 | V bolt  |
|    | 1 seat back frame   |
|    | 10 side frame   |
|    | 10A inner side frame constituting body  |
|    | 11A inner plate   |
| 40 | 11a front listing wire locking hole (locking hole)  |
|    | 11b rear listing wire locking hole (locking hole)   |
|    | 12A inner front edge  |
|    | 13A inner rear edge   |
|    | 10B outer side frame constituting body  |
| 45 | 11B outer plate   |
|    | 11c airbag module attachment hole   |
|    | 12B outer front edge  |
|    | 13B outer rear edge   |
|    | 21 upper frame  |
| 50 | 22 lower frame  |
|    | 23 pillar support portion   |
|    | 2 seat frame  |
|    | 3 reclining mechanism   |
|    | 4 trim cover  |
| 55 | 40 fracture portion   |
|    | 41 front surface gusset portion   |
|    | 42 side surface gusset portion  |
|    | 5 cushion pad   |
|    | 6 airbag module   |
| 60 | 61 inflator   |
|    | 62 attachment bracket (attachment member)   |
|    | 63 airbag   |
|    | 64 inflator bracket   |
|    | 7 space   |
| 65 | 8 listing wire  |
|    | 8A front listing wire, guide member end attachment member, stay cloth end attachment member |



**81a** front stay cloth engagement portion (guide member engagement portion)  
**82a** front leg portion  
**83a** front locking portion  
**8B** rear listing wire, guide member end attachment member, stay cloth end attachment member  
**81b** rear stay cloth engagement portion (guide member engagement portion)  
**82b** rear leg portion  
**83b** rear locking portion  
 G action force  
 P pivot point  
**31** first stay cloth (guide member)  
**32** second stay cloth (guide member)  
**34** edge near fracture portion  
**35** edge opposite to fracture portion  
**36** attachment portion  
**37** trim plate  
**38** one edge

## First Modified Example

**1** seat back frame  
**100** second side frame  
**110B** second outer side frame constituting body  
**111B** second outer plate  
**H1** second front concave portion (interference suppressing portion)  
**111a** second front listing wire locking hole (locking hole)  
**H2** second rear concave portion (interference suppressing portion)  
**111b** second rear listing wire locking hole (locking hole)  
**112B** second outer front edge  
**113B** second outer rear edge

## Second Modified Example

**1** seat back frame  
**200** third side frame  
**210A** third inner side frame constituting body  
**211A** third inner plate  
**211a** third inner front listing wire locking hole (locking hole)  
**211b** third inner rear listing wire locking hole (locking hole)  
**212A** third inner front edge  
**213A** third inner rear edge  
**210B** third outer side frame constituting body  
**211B** outer plate  
**H3** third concave portion (interference suppressing portion)  
 (H31 third upper concave portion)  
 (H32 third lower concave portion)  
**211d** third outer front listing wire locking hole (locking hole)  
**211e** third outer rear listing wire locking hole (locking hole)  
**212B** third outer front edge  
**213B** third outer rear edge

## Third Modified Example

**1** seat back frame  
**300** fourth side frame  
**310A** fourth inner side frame constituting body  
**311A** fourth inner plate  
**311f** engagement hole  
**312A** fourth inner front edge  
**313A** fourth inner rear edge  
**310B** fourth outer side frame constituting body

**311B** fourth outer plate  
**H4** fourth front concave portion (interference suppressing portion)  
**H5** fourth rear concave portion (interference suppressing portion)  
**311a** fourth front listing wire locking hole (locking hole)  
**311b** fourth rear listing wire locking hole (locking hole)  
**312B** fourth outer front edge  
**313B** fourth outer rear edge  
 10 The invention claimed is:  
 1. A seat frame comprising:  
 a seat back frame in which an airbag module is disposed;  
 wherein:  
 the seat back frame comprises a guide member end attachment member that locks an end of a guide member for facilitating deployment of an airbag provided in the airbag module;  
 a guide member attachment position of the guide member end attachment member is disposed at an inside of the seat back frame in relation to an airbag module attachment position; and  
 the guide member end attachment member comprises:  
 a guide member engagement portion that locks the guide member;  
 leg portions that are respectively bent at an obtuse angle from both ends of the guide member engagement portion and extend in a same direction; and  
 locking portions that respectively extend from front extension portions of the leg portions while being bent in a direction moving away from the guide member engagement portion,  
 the locking portions are locked to locking holes formed in side frames extending while being separated from each other in a width direction of the seat back frame;  
 the airbag module is disposed at an outside of the side frame; and  
 the guide member engagement portion engages with an end of the guide member at an inside of the side frame in relation to the airbag module attachment position.  
 2. The seat frame according to claim 1, wherein the leg portions are:  
 disposed to extend from the locking holes toward a front or rear side of the side frame; and  
 bent to follow a shape of a front or rear corner of the side frame.  
 3. The seat frame according to claim 1, wherein:  
 a plurality of the locking portions are locked to a plurality of the locking holes formed in the side frame;  
 a minimal distance between the plurality of the locking portions is set to be larger than a distance between the plurality of the locking holes;  
 the guide member end attachment member is formed as a flexible member; and  
 when the plurality of the locking portions are locked to the plurality of the locking holes while a force is applied to a plurality of the leg portions so that the minimal distance between the plurality of the locking portions decreases, and the force is released, the locking portions are locked by restoration forces of the plurality of the leg portions.  
 4. The seat frame according to claim 1, wherein the side frame is provided with an interference suppressing portion that stores the locking portion to suppress an interference with an airbag module attachment member.  
 5. The seat frame according to claim 4, wherein:  
 the interference suppressing portion is a hole that protrudes toward the inside of the side frame and a bottom



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surface of the interference suppressing portion is provided with the locking hole; and  
a free end of the locking portion is inserted in a direction from the inside of the side frame toward the outside thereof to be located within the interference suppressing portion. 5

**6.** A seat frame comprising:  
a seat back frame in which an airbag module is disposed; wherein:  
the seat back frame comprises a stay cloth end attachment member that locks an end of a stay cloth for facilitating deployment of an airbag provided in the airbag module; the stay cloth end attachment member comprises:  
a stay cloth engagement portion that engages with the stay cloth; and 15  
locking portions that respectively extend while being bent in a direction moving away from the stay cloth engagement portion;  
the stay cloth engagement portion is disposed at an inner side of the seat back frame in a seat back frame width direction in relation to an airbag module attachment position at which the airbag module is attached to the seat back frame; and  
the locking portions are locked to locking holes formed in side frames extending while being separated from each other in the seat back frame width direction. 25

**7.** The seat frame according to claim **6**, wherein:  
the stay cloth end attachment member further comprises:  
leg portions that are respectively bent at an obtuse angle from both ends of the stay cloth engagement portion and extend in a same direction; 30  
the airbag module is disposed at an outside of the side frame; and  
the stay cloth engagement portion engages with an end of the stay cloth at an inner side of the side frame in the seat back frame width direction in relation to the airbag module attachment position. 35

**8.** The seat frame according to claim **7**, wherein the leg portions are:  
disposed to extend from the locking holes toward a front or rear side of the side frame; and 40  
bent to follow a shape of a front or rear corner of the side frame.

**9.** The seat frame according to claim **7**, wherein:  
a plurality of the locking portions are locked to a plurality of the locking holes formed in the side frame; 45  
a minimal distance between the plurality of the locking portions is set to be larger than a distance between the plurality of the locking holes;  
the stay cloth end attachment member is formed as a flexible member; and 50  
when the plurality of the locking portions are locked to the plurality of the locking holes while a force is applied to a plurality of the leg portions so that the minimal distance between the plurality of the locking portions decreases, and the force is released, the locking portions are locked by restoration forces of the plurality of the leg portions. 55

**10.** The seat frame according to claim **7**, wherein the side frame is provided with an interference suppressing portion that stores the locking portion to suppress an interference with an airbag module attachment member. 60

**11.** The seat frame according to claim **10**, wherein:  
the interference suppressing portion is a hole that protrudes toward the inside of the side frame and a bottom surface of the interference suppressing portion is provided with the locking hole; and 65

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a free end of the locking portion is inserted in a direction from the inside of the side frame toward the outside thereof to be located within the interference suppressing portion.

**12.** A seat frame comprising:  
a seat back frame in which an airbag module is disposed; wherein:  
the seat back frame comprises a guide member end attachment member that locks an end of a guide member for facilitating deployment of an airbag provided in the airbag module;  
the guide member end attachment member is a wire and comprises:  
a guide member engagement portion that engages with the guide member; and  
locking portions that respectively extend while being bent in a direction moving away from the guide member engagement portion;  
the guide member engagement portion is disposed at an inner side of the seat back frame in a seat back frame width direction in relation to an airbag module attachment position at which the airbag module is attached to the seat back frame; and  
the locking portions are locked to locking holes formed in side frames extending while being separated from each other in the seat back frame width direction.

**13.** The seat frame according to claim **12**, wherein:  
the guide member end attachment member comprises:  
leg portions that are respectively bent at an obtuse angle from both ends of the guide member engagement portion and extend in a same direction;  
the airbag module is disposed at an outside of the side frame; and  
the guide member engagement portion engages with an end of the guide member at an inner side of the side frame in the seat back frame width direction in relation to the airbag module attachment position.

**14.** The seat frame according to claim **13**, wherein the leg portions are:  
disposed to extend from the locking holes toward a front or rear side of the side frame; and  
bent to follow a shape of a front or rear corner of the side frame.

**15.** The seat frame according to claim **13**, wherein:  
a plurality of the locking portions are locked to a plurality of the locking holes formed in the side frame;  
a minimal distance between the plurality of the locking portions is set to be larger than a distance between the plurality of the locking holes;  
the stay cloth end attachment member is formed as a flexible member; and  
when the plurality of the locking portions are locked to the plurality of the locking holes while a force is applied to a plurality of the leg portions so that the minimal distance between the plurality of the locking portions decreases, and the force is released, the locking portions are locked by restoration forces of the plurality of the leg portions.

**16.** The seat frame according to claim **13**, wherein the side frame is provided with an interference suppressing portion that stores the locking portion to suppress an interference with an airbag module attachment member.

**17.** The seat frame according to claim **16**, wherein:  
the interference suppressing portion is a hole that protrudes toward the inside of the side frame and a bottom surface of the interference suppressing portion is provided with the locking hole; and

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a free end of the locking portion is inserted in a direction from the inside of the side frame toward the outside thereof to be located within the interference suppressing portion.

\* \* \* \* \*

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**24**